
II. RUNNING THE HATFIELD MODEL

D. CREATING A NEW WORKFILE

- Select 'HM Tools/New HM Workfile...'
- Select the appropriate state from the dialog box.
- Select 'HM Tools/Save HM Workfile...' to give the workfile a unique name.
- Press 'GO!'
- Save Expense Module when HM is done calculating
- Select 'HM Tools/Close HM Workfile...' when finished

E. MODIFYING AN EXISTING WORKFILE

Once a workfile has been created, it can be modified to reflect different input parameters. To modify an existing workfile:

- Select 'HM Tools/Open HM Workfile...'
- Modify inputs as necessary, using process described below
- Press 'GO!'
- Save Expense Module when HM is done calculating
- Select 'HM Tools/Close HM Workfile...' when finished

F. CHANGING USER INPUTS

The HM contains several hundred user-adjustable parameters, each of which can be easily modified using the HM Interface. To change a user input, open the appropriate workfile, and select the desired category of inputs from the 'HM Inputs' menu. A dialog box will appear, in which alternative inputs may be specified. (See Figure 2.) If the workfile is saved, the alternative inputs will be saved with it. However, default inputs can always be restored by clicking the 'Reset Defaults' button on the input dialog box.

G. TROUBLESHOOTING

- If the HM Interface displays 'Cannot find file...' errors, ensure that the paths and filenames are correctly specified in the 'HM Tools/Set Paths and Filenames...' menu.
- In the unlikely event that the HM crashes, it is always best to restart.

Figure 1: HM Interface

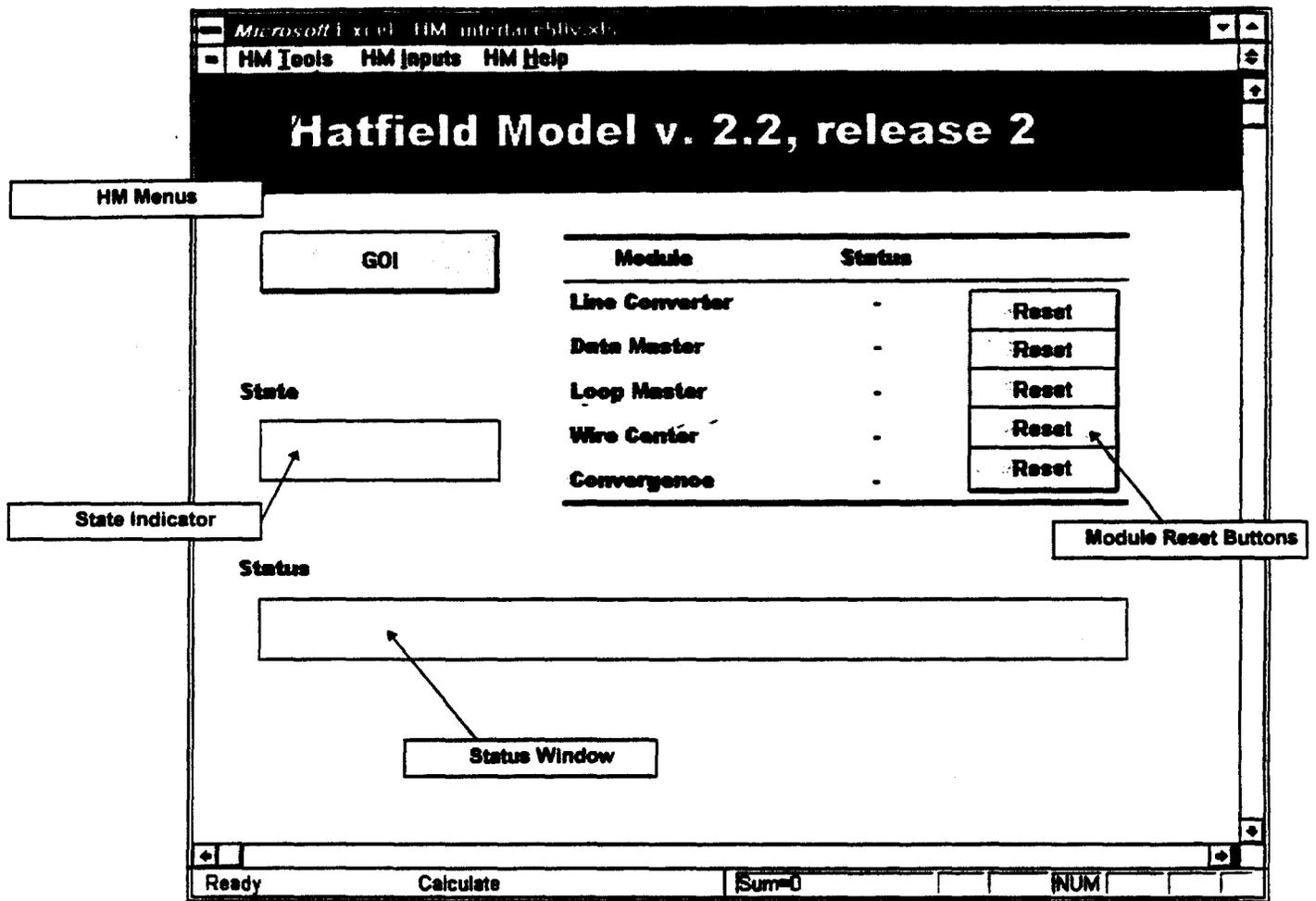


Figure 2: Sample User Input Dialog Box

Misc Loop Investment Inputs

	Drop Investment per line	NID Investment per line	Terminal & Splice per line	Avg lines per business location	Distribution cable size	SAI Investment, installed	
						copper	fiber feeder
	\$40.00	\$30.00	\$35.00	4	0	\$500.00	\$2,500.00
					100	\$700.00	\$2,700.00
					200	\$900.00	\$2,900.00
					400	\$1,100.00	\$3,100.00
Distribution structure X assigned to telephone					600	\$1,300.00	\$3,300.00
	Aerial	0.33			900	\$1,500.00	\$3,500.00
	Buried	0.33			1200	\$1,700.00	\$3,700.00
	Underground	0.33			1800	\$1,900.00	\$3,900.00
Feeder structure X assigned to telephone					2400	\$2,100.00	\$4,100.00
	Aerial	0.33			3000	\$2,300.00	\$4,300.00
	Buried	0.33			3600	\$2,500.00	\$4,500.00
	Underground	0.33					

OK

(Help) Reset Defaults Cancel

Appendix C

BCM-PLUS Loop Module Inputs

Cable fill factors

density	Feeder	Distribution
0	0.65	0.5
5	0.75	0.55
200	0.8	0.6
650	0.8	0.65
850	0.8	0.7
2550	0.8	0.75

DS-0s per fiber Fibers per RT

DLC case	2016	4
AFC case	2016	4

Fiber feeder distance threshold, ft
9,000

Fiber feeder cable inv per foot

Cable Size	u/g	aerial
216	\$ 13.10	\$ 13.10
144	\$ 9.50	\$ 9.50
96	\$ 7.10	\$ 7.10
72	\$ 5.90	\$ 5.90
60	\$ 5.30	\$ 5.30
48	\$ 4.70	\$ 4.70
36	\$ 4.10	\$ 4.10
24	\$ 3.50	\$ 3.50
18	\$ 3.20	\$ 3.20
12	\$ 2.90	\$ 2.90

Distribution cable inv per ft

Cable Size	u/g	aerial
3600	\$ 63.75	\$ 63.75
3000	\$ 53.25	\$ 53.25
2400	\$ 42.75	\$ 42.75
1800	\$ 32.25	\$ 32.25
1200	\$ 21.75	\$ 21.75
900	\$ 16.50	\$ 16.50
600	\$ 11.25	\$ 11.25
400	\$ 7.75	\$ 7.75
200	\$ 4.25	\$ 4.25
100	\$ 2.50	\$ 2.50
50	\$ 1.63	\$ 1.63
25	\$ 1.19	\$ 1.19

Copper feeder cable inv per ft

Cable Size	u/g	aerial
4200	\$ 74.25	\$ 74.25
3600	\$ 63.75	\$ 63.75
3000	\$ 53.25	\$ 53.25
2400	\$ 42.75	\$ 42.75
1800	\$ 32.25	\$ 32.25
1200	\$ 21.75	\$ 21.75
900	\$ 16.50	\$ 16.50
600	\$ 11.25	\$ 11.25
400	\$ 7.75	\$ 7.75
200	\$ 4.25	\$ 4.25
100	\$ 2.50	\$ 2.50

Appendix C

Wire Center Investment Module Inputs

EO switching and traffic parameters

switch real-time limit, BHCA	lines	limit
	1	10,000
	1,000	50,000
	10,000	200,000
	40,000	600,000

switch traffic limit, BHCCS

	lines	limit
	1	10,000
	1,000	50,000
	10,000	500,000
	40,000	1,000,000

switch maximum line size

100,000

switch max line fill

0.80

switch max processor occupancy

0.90

processor feature loading multiplier

1.00

switch installation multiplier

1.1

Interoffice parameters

operator traffic fraction

0.02

total interoffice traffic fraction

0.65

direct-routed fraction of local interoffice

0.98

Transmission parameters

maximum trunk occupancy, CCS

27.5

trunk port, per end

\$ 100.00

average direct route distance, miles

10

average trunk usage fraction

0.3

Tandem switching parameters

real time limit, BHCA

1,500,000

port limit, trunks

120,000

common equipment investment

\$ 1,000,000

maximum trunk fill

0.8

maximum real time occupancy

0.9

common equipment intercept factor

0.25

switch price/line size references

switch price per line, less trunk circuits @ \$	220.00	\$	86.00	\$	59.00
switch line size	2,782		11,200		80,000

BH fraction of daily usage

0.10

Annual to daily usage reduction factor

270

residential holding time multiplier

1.0

business holding time multiplier

1.0

(offered load assumed for afternoon busy hour)

call attempts/BH

residential

1.3

business

3.5

Signaling parameters

STP link capacity

720

STP maximum fill

0.8

STP investment, per pair, fully equipped

\$ 5,000,000

STP common equipment investment, per pair

\$ 1,000,000

link termination, both ends

\$ 900

signaling link bit rate

56,000

link occupancy

0.4

C link cross section

24

ISUP messages per interoffice BHCA

8

ISUP message length, bytes

25

TCAP messages per transaction

2

TCAP message length, bytes

100

fraction of BHCA requiring TCAP

0.10

SCP investment/transaction/second

\$ 20,000

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Wire Center Investment Module Inputs

Operator position parameters
 investment per position \$ 3,500
 maximum utilization per position, CCS 27
 operator intervention factor 10
 operator position remote distance, mi 0

Wire center parameters

lot size, multiplier of switch room size 2
 tandem/EO wire center common factor 0.40

Power and frame investment
 served lines in wire center

	sum of power and frame
0 \$	10,000
1,000 \$	20,000
5,000 \$	40,000
25,000 \$	100,000
50,000 \$	500,000

Switch room size table

switch size, lines	floor area required
0	500
1,000	1,000
5,000	2,000
25,000	5,000
50,000	10,000

Construction costs, per sq ft
 switch size, lines

	construction, \$/sq ft
0 \$	75
1,000 \$	85
5,000 \$	100
25,000 \$	125
50,000 \$	150

Land price, per sq ft
 lines in wire center

	price/sq ft
0 \$	5.00
1,000 \$	7.50
5,000 \$	10.00
25,000 \$	15.00
50,000 \$	20.00

Public telephone, per station \$ 1,200

Toll traffic inputs

local call attempts
 call completion factor 0.70
 intraLATA calls completed
 interLATA intrastate calls completed
 interLATA interstate calls completed
 local DEMs, thousands
 intrastate DEMs, thousands
 interstate DEMs, thousands
 tandem-routed fraction of total intraLATA traffic 0.2
 average direct intraLATA route distance, mi 25
 tandem-routed fraction of total interLATA traffic 0.2
 average direct access route distance, mi 15

Interoffice transport investment

Terminal investment Unit Cost
 Number of fibers 24
 FOT capacity, DS-3s 12
 FOT fill 0.80
 FOT, installed \$ 43,000
 Pigtails \$ 60
 Panel \$ 1,000
 EF&I, per hour \$ 55
Medium investment
 Fraction of structure assigned to telephone 0.33
 Fraction of structure shared with feeder 0.25
 Distance, mi 41
 Regenerator spacing, mi 40
 Regenerator investment, installed \$ 15,000
 Fiber cable inv/ft \$ 2.00
 Placement \$ 2.00
 Splice spacing, ft 20,000
 Splice cost \$ 15.00
 Trenching/ft \$ 45.00
 Resurfacing/ft \$ 10.00
 Conduit/ft \$ 4.00
 Number of tubes 2
 Manhole spacing 1,000
 Manhole inv per manhole \$ 5,000
 Total Conduit
 Buried installation/ft \$ 5.00
 Pole inv. \$ 450
 Pole spacing 150
Weighting

underground 0.3500
 buried 0.5000
 aerial 0.1500

Appendix C

Convergence Module Inputs

drop investment per line	\$	40
NID investment per line	\$	30
terminal and splice per line	\$	35
average lines per business location		4

Distribution cable size	SAI investment (installed)	
	copper feeder	fiber feeder
0	\$ 500.00	\$ 2,500.00
100	\$ 700.00	\$ 2,700.00
200	\$ 900.00	\$ 2,900.00
400	\$ 1,100.00	\$ 3,100.00
600	\$ 1,300.00	\$ 3,300.00
900	\$ 1,500.00	\$ 3,500.00
1200	\$ 1,700.00	\$ 3,700.00
1800	\$ 1,900.00	\$ 3,900.00
2400	\$ 2,100.00	\$ 4,100.00
3000	\$ 2,300.00	\$ 4,300.00
3600	\$ 2,500.00	\$ 4,500.00

Digital loop carrier inputs

BCM "SLC" (TR-303)

site, housing, and power per RT	\$	3,000
maximum lines		672
RT fill factor		0.90
common equipment investment	\$	42,000
channel unit investment per line	\$	75

BCM "AFC"

site, housing, and power per RT	\$	2,500
maximum lines		100
RT fill factor		0.90
common equipment investment	\$	10,000
channel unit investment per line	\$	150

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Convergence Module Inputs

Distribution structure inputs

density range limit	aerial fraction	buried fraction	underground fraction	buried installation/foot	conduit installation/foot
0	0.50	0.50	-	\$ 2.00	\$ 25.00
5	0.50	0.50	-	\$ 2.00	\$ 25.00
200	0.50	0.50	-	\$ 2.00	\$ 25.00
650	0.50	0.50	-	\$ 3.00	\$ 25.00
850	0.40	0.50	0.10	\$ 3.00	\$ 45.00
2550	0.65	0.05	0.30	\$ 20.00	\$ 70.00

pole spacing, feet 150
 pole investment \$ 450
 conduit investment per foot \$ 1.00 w/o trenching
 manhole investment, per manhole \$ 3,000
 buried cable armoring multiplier 1.10

Feeder structure inputs

Copper

density range limit	aerial fraction	buried fraction	underground fraction	manhole spacing, f	buried installation/foot	conduit installation/foot
0	0.50	0.45	0.05	800	\$ 2.00	\$ 25.00
5	0.50	0.45	0.05	800	\$ 2.00	\$ 25.00
200	0.50	0.45	0.05	800	\$ 2.00	\$ 25.00
650	0.40	0.40	0.20	800	\$ 3.00	\$ 25.00
850	0.10	0.10	0.80	600	\$ 3.00	\$ 45.00
2550	0.05	0.05	0.90	400	\$ 25.00	\$ 75.00

pole spacing, feet 150
 pole investment \$ 450
 conduit investment per foot \$ 1.00 w/o trenching
 manhole investment, per manhole \$ 3,000
 buried cable armoring multiplier, Cu 1.10

Fiber

density range limit	aerial fraction	buried fraction	underground fraction	manhole spacing, f	buried installation/foot	conduit installation/foot
0	0.35	0.60	0.05	2000	\$ 2.00	\$ 25.00
5	0.35	0.60	0.05	2000	\$ 2.00	\$ 25.00
200	0.35	0.60	0.05	2000	\$ 2.00	\$ 25.00
650	0.20	0.60	0.20	2000	\$ 3.00	\$ 25.00
850	0.10	0.10	0.80	2000	\$ 3.00	\$ 45.00
2550	0.05	0.05	0.90	2000	\$ 20.00	\$ 70.00

Buried cable armoring per foot, fiber \$ 0.20

Appendix C

Expense Module Inputs

Debt fraction		0.45
Cost of Debt		0.077
Cost of Equity		0.119
corporate overhead factor		0.100
other taxes factor		0.050
operating state and local income tax factor		0.010
billing/bill inquiry per line per month	\$	1.22
directory listing per line per month	\$	0.15
service order processing fraction of 6623		0.346
forward-looking network operations factor		0.700
alternative CO switching factor		0.0269
alternative circuit equipment factor		0.0153
EO traffic-sensitive fraction		0.70
per-line monthly LNP cost	\$	0.25
Carrier-carrier customer service, per line per year	\$	1.56
NID expense per line per year	\$	3.00
DS-0/DS-1 crossover		24
DS-1/DS-3 crossover		28
Switch line circuit offset per DLC line	\$	35.00

Structure fraction assigned to telephone

distribution	
aerial	0.33
underground	0.33
buried	0.33
feeder	
aerial	0.33
underground	0.33
buried	0.33

economic life and tax inputs

tax rate	0.40
economic life -- 50 years maximum	
loop distribution	20
loop feeder	20
loop concentrator	10
end office switching	14.3
wire center	37
tandem switching	14.3
OS investment	8
transport facilities	19
STP	14
SCP	14
links	19
public telephones	9
general support	7